EUCLIS: EUCLOCK Information System

Version 2.5

User's Guide

About EUCLIS

The EUCLOCK Information System (EUCLIS) is a comprehensive, web-based information system that aims to serve as a venue for chronobiologists for efficient networking and collaboration. It provides support for the organization of experimental data through facilities for results storage, systematic annotation and data visualization. It also houses a digital library, which contains organized bibliographic references of the various researchers, as well as a repository of course materials. EUCLIS can be accessed at http://www.bioinfo.mpg.de/euclis/.

EUCLIS Architecture

The general architecture of EUCLIS integrates a database for circadian systems biology, containing modules for experimental data (Clock Experiments) and models (Clock Models) with a digital library (Clock KnowledgeBase) for the research community (Figure 1). This architecture will provide a more flexible framework for the evolving information needs of the chronobiology community than current access, mining and data warehouse approaches in other information systems. This architecture will also allow easier integration with other systems in the future.

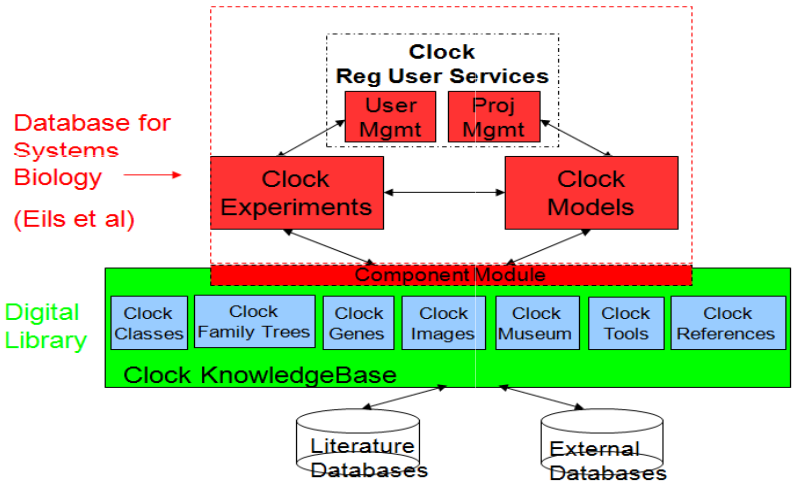


Figure 1. EUCLIS architecture

The current release of EUCLIS has a new module, Clock Models, alongside enhanced versions of modules from previous releases, Clock Classes, Clock Experiments, Clock Family Trees, Clock Genes, Clock Images, Clock Museum, Clock References and Clock Tools.

EUCLIS Modules

Clock Family Trees allows users to document and trace their ancestry in the chronobiology research community. It also serves as a virtual dictionary of chronobiologists, where fields of specialization and dissertation information are indicated.

Clock Images serves as a repository of image files and associated information from EUCLIS users. It provides facilities for image viewing, sharing and organization .

Clock References provides researchers access to a central reference repository with integrated tools for bibliographic information sharing. This module also contains a special section for dissertations in chronobiology. A separate module, Clock Classes, serves as a repository of materials for chronobiology-related courses including selected presentations from summer schools.

Clock Museum provides a venue for organizing images and references into collections containing information on relevant events in chronobiology history. It also allows the users to generate slideshows using these material, and to make annotations to such collections. This module makes use of existing entries in Clock Images and Clock References.

Clock Experiments stores and manages sets of experiments, which are comprised of integrated experimental results and links to relevant components from the KnowledgeBase, mainly genes and references. These will eventually include modelling and simulation results from Clock Models. Clock Experiments also provides facilities for managing resources involved per experiment, and for managing links to Clock Genes and Clock References. It also provides a tool for graphic visualization of experiment data files containing activity time series (double plots). Each experiment set has its own users that may have different privileges.

Clock Genes provides an integrated view of information regarding the circadian genes of model organisms of interest in chronobiology. The current release contains gene catalogues for *Neurospora crassa, Synechococcus aureus, Homo sapiens, Arabidopsis thaliana, Drosophila melanogaster, and Mus musculus.*

Clock Models contains a taxonomy of existing models of chronobiological data; this taxonomy classifies models based on information such as the methods used for creating the model, the scale and scope of the model, as well as the organism or organisms for which the model was developed. Entries in clock models has links to the references from which these models were obtained.

Clock Tools provides descriptions and links to software used by the EUCLOCK community for processing and analysing chronobiology-related data.

The Clock Registered User Services module (Clocks R US) handles the management of user accounts, which can be divided into several levels based on associated privileges. Clocks R Us is also used for the management of user sets, which provides the additional possibility of having specialized access levels for collections or sets in selected modules.

How to use the manual

The manual is organized according to the different clock modules, with the corresponding functionalities for each module listed to approximate typical access flow. Functions for more general access are listed before those requiring stricter access conditions. *Access levels for module features are always indicated before each set of described functionalities. Functionalities that require higher access levels are listed towards the end of each section.* For information on this, please refer to **User Access** section.

All entries that cross-reference other material in the manual or external web pages appear in **boldface**. All page tabs are linked to their corresponding sections in the manual.

User Access

A role-based authorization scheme was implemented in the system to manage information accessibility. Each user role is associated with certain functionalities; these are assigned to persons eligible for registration by the EUCLOCK project management team. The following table summarizes the roles that have been defined per module:

User Levels	Clocks R Us	Clock Classes	Clock Experiments	Clock Family Trees	Clock Genes	Clock Images	Clock Models	Clock Museum	Clock References	Clock Tools
5	Administrator									
4		Class Coordinator	Project Lead Investigator	Patriarch	Lead Annotator	Image Set Coordinator	Model Coordinator	Lead Curator	Collection Coordinator	
3		Contributor	Project Investigator		Annotator	Image Set Contributor		Curator	Contributor	
2		Restricted User	Restricted User			Restricted User			Restricted User	
1		Registered User								
0		Unregistered User								

Each user role is assigned independently per module (i.e. one can be a contributor under Clock Library and a restricted user under Clock Classes), with each user level having approximately similar access permissions across modules. These are as follows:

User Level 0
Unregistered users may view the general information about each EUCLIS module, but will not be able to access any data. In order to acquire access rights, unregistered users may request for an account (see **Requesting for a User Account).**

User Level 1
In addition to general information access, registered users will be able to view material with general visibility in the module in which s/he is registered, but

will generally be unable to download these. Registered users may not upload material in EUCLIS.

User Level 2
Apart from viewing data, restricted users are allowed to download data. There are also some material that are visible to restricted, but not to registered users. Restricted users, however, do not have upload privileges.

User Level 3
A project investigator has similar access capabilities as restricted users, but with the additional capability of editing project details, including data on members involved, gene links, and bibliographic entry links. Users with this access level may edit the sets of data within the module for which they have level 3 access.

User Level 4
In addition to the basic functions of viewing data and downloading material, users with this access level can create and delete sets (project lead investigator), annotate genes (lead annotator), add entries to the library (collection coordinator) or manage class material (class coordinator). They can also edit details in existing data sets, where applicable. **This role is granted to a list of pre-approved users only.** All users with this access level have file upload privileges, and are allowed to create, delete and manage sets of data within the module for which they have level 4 access. They can also manage the members to which the data within a set are visible.

User Level 5
Administrators have similar access privileges as restricted users. Apart from this, the administrator is responsible for granting requests for user accounts, as well as for granting primary user roles (user level 4) in the system. Administrator functions are not discussed in this manual. References to user roles will be made in each module for purposes of clarity.

Clocks R US

The Clocks Registered User (Clocks R US) module provides the accessibility and user account management interfaces for the system. Clocks R Us also provides a general search facility that will allow users to find information within EUCLIS through a keyword search.

Requesting for a User Account

An unregistered user may request for an account to access the EUCLIS modules. From the main page, go to **Home**, and select the **request** button. This redirects you to a page through which you must specify your login details and contact information. Fill out all required fields, then press **request** to submit. If your request is approved, your account will be activated within 24 hours of receipt. Account details will be sent via e-Mail.

Logging in to EUCLIS

All users with existing accounts can access EUCLIS resources by logging in to the system. From the main page (**Home**), select **Login**. Provide your login details and press **login** to submit.

Logging out from the system

All logged users will have the option to logout from the system through an additional link in the sidebar that appears upon login.

Changing account details

Editing user information

Logged users may edit their profiles by selecting the **my profile** link and changing the information associated with their account. Select the **update** button to save the changes.

Changing your password

Logged users may change their passwords by selecting the **my profile** link, then the **change password** link. A user must type his/her old password, as well as his/her new password. Click **update** to save changes.

Requesting for a new password

Registered users may request for a new password by sending an e-mail to ClockHelp (clockhelp@rzg.mpg.de); this will be issued within 24 hours of the request.

Restricted function
User level requirement: **primary user (for each module), administrator**

User set management

A user set is used to define subsets of users who participate in selected activities within the chronobiology community.

User set creation

From the sidebar, select the **manage user set** link. You will then be redirected to a page from which you can create a user set by clicking on the **Add new user set** button. Enter a name and a description for your user set then click **submit**.

Editing user sets

From the sidebar, select the **manage user set** link. Select the **edit** link of the class that you wish to edit, change the user set information, then click **submit**. **Primary users of each module will only be allowed to edit classes that you have created.**

Adding members to a user set

From the sidebar, select the **manage user set** link, then select the link to the class to which you wish to add members. Click on the **add members** button, then select the users that you wish to add to the set from the list. Click **submit** to add the members.

Deleting members from a user set

From the sidebar, select the **manage user set** link, then select the link to the class from which you wish to remove members. Select the **delete** link that appears beside the name of each member of a user set, then select **yes** to confirm user set deletion.

Deleting user sets

From the sidebar, select the **manage user set** link, then select the **delete** link of the user set you wish to remove. Click **yes** to confirm deletion. **Primary users of each module will only be allowed to delete classes that you have created.**

Clock Classes

Clock Classes contain lecture materials, including lecture notes, posters and slide presentations from courses offered by EUCLOCK researchers.

Viewing Classes

Courses offered may be viewed by a logged user from any page by clicking on the **Clock Classes** sidebar link.

Viewing Course Materials

Course materials available for each class may be viewed by clicking the **title** of a course on the main **Clock Classes** page. Information on course materials will be displayed if these are available.

Restricted function
User level requirement: **restricted user**

Downloading Course Materials

Course materials may be downloaded by users designated as participants in a class by the class coordinator. To download course material, click on its **filename**; the file will be opened in a new browser window.

Restricted function
User level requirement: **class contributor**

Uploading Course Materials

To upload course material, select the name of the course from the **Clock Classes** page. Specify the location of the file you wish to upload and click the **upload** button.

Restricted function
User level requirement: **class coordinator**

Adding a class

Select the **Clock Classes** link from the sidebar, then select the link to the **class set** to which you wish to add a class. Click on the **Add new class** button that appears , enter the information about the class you wish to add, then click **submit**.

Editing a class

Select the **edit** link for the class whose information you wish to change. Enter the new information on the class, then click **submit. Users will only be allowed to edit classes that they have created.**

Managing a class

Adding participants to a class

Select the name of the class to which you wish to add members, then select the **manage class participants** link. On the page that appears, click on the **add participants** button. You will be redirected to a page containing a list of all registered users of EUCLIS. Click on the checkboxes beside the names of the users you wish to add, then select the appropriate class role that you wish to assign to them from the dropdown menu. Click **submit** to save the changes.

Editing participant roles

From the manage class participants page of a class, click on the name of the participant whose role you wish to alter. This redirects you to a page containing the information about the participant. Click the **edit** button, select the new participant role from the dropdown list, then click **submit** to save changes.

Removing participants from a class

From the manage class participants page of a class, select the delete link beside the participant that you wish to remove, then select **yes** to confirm.

Deleting a class

Select the **delete** link beside the name of a class that you wish to delete from a class set, then click **yes** to confirm deletion. **Users will only be allowed to delete classes that they have created.**

Clock Experiments

The clock experiments module contains experiment sets, which allow the modularized management of biological information in EUCLIS. Each experiment set may contain links to the following data:

Experiments, which correspond to actual laboratory experiments, and contains a description, associated data files, and accessibility details
Data files, which contains experiment details, including the organism on which it was performed, when it was performed and SOP details. It also contains the link to the double plot, when applicable.

Experiment sets may be accessed by members (at least a **registered user**) specified by its creator. Details of the access privileges in Clock Experiments are as follows:

User Level	Experiment Access Level	Privileges					
		View Experiments	Download Data Files	Upload Data Files	Edit Experiment Set Details	Assign Membership in an Experiment Set	Create or Delete Experiment Sets
2	Accessible to Project Lead Investigator	✓	✓	✓	✓	✓	✓
3	Accessible to Project Investigator	✓	✓	✓	✓	✓	×
4	Accessible to Restricted User	✓	✓	×	×	×	×
5	Accessible to Registered User	✓	✓/×*	×	×	×	×

*This is at the discretion of the owner of the experiment set, who may or may not make data files available to registered users.

Viewing Experiments Sets

Experiment sets may be accessed by a logged user from any page by clicking on the **Clock Experiments** sidebar link. A table of experiment sets and their descriptions will be displayed, from which a user may select the set that s/he is interested in. To view its content, click on its name. Users may view the members of an experiment set through this page.

Viewing Experiments

To view the details and contents of an experiment, click on the name of the experiment from the **experiment set** page (see **Viewing Experiment Sets**). This redirects you to a page containing the data files for a particular experiment which you may access.

Restricted functions
User level requirement: **restricted user**

Viewing Data Files*

Data files may be accessed through the **experiment details** page. To view a data file, click on its name. Additional data file details and links for **downloading the data file** and **viewing the double plot** are shown.

Downloading Data Files

From the **data file** page, click on the **download data file** button. This opens a new browser window, where the data file contents will be loaded. Use your browser's save function to create a local copy.

Viewing Double Plots

Double plots that show activity time series data and visible light protocol information may be downloaded from the **data file** page. Click on the **go** button beside the double plot name; the image is opened in a separate browser window. To save a local copy, right click on the image and click Save Target As.

*As with data file download, the availability of this feature is at the discretion of the owner of an experiment set.

Restricted functions
User level requirement: **project lead investigator/project investigator**

Editing Experiment Sets

Access the experiment set that you wish to edit (see **Viewing Experiment Sets**). On the **experiment set** page, select **edit**. A form appears wherein you can perform any of the following functions:

1. Modify project details
2. Add experiments
3. Add links to genes
4. Add links to references
5. Remove links (to genes, and/or references)
6. Viewing members and editing membership

Each function will be discussed in the succeeding subsections.

Modifying project details

To change the experiment set title or description, type the modifications in the appropriate fields on the form and click **save details**.

Adding experiments

To add an experiment, click on the **add** link beside the experiments table header. This opens a new browser window where you can specify the experiment name, the experiment details and experiment accessibility. If you wish your experiment to be accessible to Registered Users, you have the option of making the data file content downloadable by ticking the **Make Data Files Accessible** checkbox. After entering the details, select **add experiment**.

Adding genes

To link a gene to an experiment, click on the **add** link beside the genes table header. A new browser window is opened where you can select the organism from which the gene to be linked originates. Select on the organism name to display its gene network map. Select the gene which you wish to link to view its details. On the same page, select **add link to project** to link the gene, or **back** to view other genes.

Adding references

To add a reference link, click on the **add** link beside the references table header. In the new browser, a list of available references is displayed. You may browse through the list or use the keyword search facility to find a specific reference. Select the title that you wish to add to display its details. Click on **link this reference**, or **back** to select another reference.

Removing links

From the form page, select the checkbox(es) of experiment(s), gene(s) or reference(s) that you wish to delete from the project, then click on **remove link**.

Viewing members and editing membership

To view the list of users who can access an experiment set, select the **view members** link. A table of users is displayed. To add a member, click on the **add member** link and select a name from the list of users. To remove (a) member(s), select the checkbox(es) beside the name of the member(s) you wish to remove from the project and click **remove member**. To change the roles of members, select the new role from the dropdown menu beside each member's name and click **update roles**.

Editing Experiments

To modify the information on an experiment, click on the experiment name from the **experiment details** page. You are automatically redirected to a page where you can make changes to the experiment title, description and/or experiment accessibility. Click on the **Save Details** button to keep changes.

Editing Data Files

On the **experiment details** page (see **Viewing Experiment Details** for access instructions), click on the data file that you wish to edit, then click the **edit** button. Enter the changes in the data file information form and click **submit**. Make sure that all required fields are filled. If you wish to upload a file to replace the data file, see **adding data files**.

Adding Data Files

This section deals with data file upload and double plot generation. To add a data file, go to the **experiment details** page (to view this, please refer to **Viewing Experiment Details**) and click the **edit** button, then select **add**. A form will be generated to enable the user to specify experiment details. Enter the title, organism, experiment date, and remarks pertaining to the data file. Indicate the location of the data file that you wish to upload by using the **Browse** button and indicate its format.

There are currently three supported data file formats :
1. Actogram with single data set
2. Actogram with multiple data sets
3. Non-actogram

A double plot image is automatically generated for the first two formats. **No double plot image will be generated for non-actograms.** For the first two formats, you need to supply information to specify how the double plot image will be generated (Please refer to **Double Plot Generation**).

Double Plot Generation

The following are SOPs in uploading data files for which double plots will be generated:

1. The SOP Type field value should have no spaces when it is entered (type in LD12:12, not LD 12:12).
2. The following should be indicated (in minutes):
    a. First time of stimulus (light/heat) application under field **First time that the stimulus (light/heat) is applied**
    b. First time of stimulus removal under field **First time that the stimulus (light/heat) ceases**

    Values for these fields are the time points when the stimulus of light or heat is turned on and turned off within a 24-hour day.

    If light/heat was applied at the onset of an experiment, the value for the first time of stimulus removal will be the first time the stimulus(light/heat) is stopped, and the value for the first time of stimulus application will be the time light/heat will be applied *again within the day*. For instance, for the SOP Type LD8:16, first time of stimulus application has a value of 1440 and the first time of stimulus removal has a value of 480.

If the experiment began in the absence of light/heat stimulation, the value for the first time of stimulus application is the first time that this is applied, while the value for first time of stimulus removal is the time light/heat will be withdrawn *within the day*. For SOP Type DL8:16 , first time of stimulus application has a value of 480 and the first time of stimulus removal has a value of 1440.

3. The sampling time/interval must be entered as integer minutes.
4. The experiment duration must be entered as integer days.
5. For the data file format actograms with multiple data sets, additional information will be required; these pertain to the contents of the actual data file to be uploaded. A detailed description is as follows:
    a. Ignore Columns refers to the number of columns from the start of the file which should not be regarded as activity data.
    b. Ignore Rows refers to the number of rows from the start of the file which should not be regarded as activity data.
    c. Total DataSets pertains to the number of columns of activity data in the file, excluding the ignored columns and rows.
    d. Delimiter Name describes the delimiter character separating the columns in the file you are about to upload.

Deleting Data Files

On the **experiment details** page, click on the data file that you wish to delete, then click **delete**. A delete confirmation dialog will be shown; to confirm delete, click OK.

Restricted functions
User level requirement: **project lead investigator**

Creating Experiment Sets

From the main page (**Clock Experiments**), select **create new project**. Indicate the project name and description on the form page, then click **add project**. To build the experiment set, see **Editing Experiment Sets**.

Deleting Experiment Sets

From the main page (**Clock Experiments**), select the name of experiment set that you want to delete, then click **delete**.

Clock Family Trees

Clock Family Trees is a repository of chronobiologists' scientific genealogy. It allows chronobiologists to create links to their PhD advisors (the "chronoparents"), their PhD advisees (the "chronochildren"), and to enter other related information. Links to their PhD theses in **Clock References**, as well as to available images in **Clock Images** are provided. Any **registered user** can access Family Trees.

Viewing/Searching Clock Family Trees' Chronobiologists

Information on chronobiologists may be viewed by a logged user from any page by clicking on the **Clock Family Trees** sidebar link. The user can view the listing of chronobiologists in Family Trees by either one of two options: a) browsing by clicking the first letter of the last name or b) searching by any of the fields like last name, first name, middle name, university, degree, year of degree, thesis/dissertation title or keywords, and specialization, and clicking on the **Submit Query** button.

Viewing Chronobiologist Details

To view information about a chronobiologist, click on the full name of the chronobiologist in the **list of chronobiologists** obtained through **Viewing/Searching Clock Family Trees' Chronobiologists**. This redirects you to a page displaying the following details available on the chronobiologist:

1. Full name
2. Photograph
3. University
4. Degree and year degree was obtained
5. Thesis/dissertation title
6. Specialization
7. Chronoparent(s)' name, university and the year the parent obtained his/her degree
8. Chronochild(ren)'s name, university, and the year each chronochild obtained his/her degree.

Viewing Chronoparent or Chronochild Details

Click on the chronoparent or chronochild link from a page displaying information on a chronobiologist (See **Viewing Chronobiologist Details**).

Adding a Chronobiogist

To add a chronobiologist's entry to EUCLIS, go to the main **Clock Family Trees** page and click the **Add chronobiologist** button. Fill up the form and click the **Continue** button to create links to the chronobiologist's photograph in **Clock Images** and/or links to a chronobiologist's thesis or dissertation in **Clock References,** as well as links to chronoparent(s). Click the **Finish** button.

*If the submission was made by a **registered user**, the entry has to be approved by a **Clock Family Trees patriarch** before it is officially added to Family Trees.*

Restricted function
User level requirement: **patriarch** or **entry creator (registered user)**

Editing Chronobiologist Details

From the **chronobiologist details** page click on the **Edit** button. Enter the changes in the form, including additional or modified links to chronoparent(s), thesis and photograph. To link images, select **add link** under photograph, then select the name of the image to be linked to an entry. Click the **Link** button to save changes. To remove or change links to an image, select either **change link** or **remove link**, then proceed as before. To link a thesis or dissertation from clock references, select **add link** under thesis/dissertation link, then select the collection that contains the dissertation. Select the title of the thesis or dissertation, then select **Link this reference**. *An entry creator can edit his/her own entry, the entry of his/her chronoparents, and the entries of his/her chronochildren.*

Deleting a Chronobiologist

From the **chronobiologist details** page, click on the **Delete** button to delete the chronobiologist. A confirmation page will be shown; to confirm deletion, click **OK**.

Restricted function
User level requirement: **patriarch**

Approval/Rejection of Submitted Chronobiologist Entries

To approve an entry submitted by a **registered user**, go to the first page of **Clock Family Trees** and click the link at end of the page. A listing of entries waiting for approval will be shown. Click on any of the names in the listing. A page displaying the details of that specific entry will be shown. To approve or reject, click on either the **Approve** or **Reject** button.

Clock Genes

The clock genes module provides fast access to an integrated view of information on circadian genes of several model organisms commonly used in chronobiology research. It is based on a concept similar to that of the MitoP2 database (http://www.mitop.de), which contains information pertaining to mitochondrial proteins. MitoP2 is a manually annotated database which consolidates protein data, molecular functions and associated diseases and distinguishes between confirmed reference proteins and candidates based on preliminary experiments or homology analysis. The current release has information on clock genes and associated proteins from *Neurospora crassa, Synechococcus aureus , Arabidopsis thaliana, Drosophila melanogaster, Mus musculus,* and *Homo sapiens*.

Viewing General Clock Gene Information

General information about the clock gene catalogue can be viewed by users from any page prior to login. To access this information, click on the **Clock Genes** link on the sidebar.

Viewing Organisms

The view of the list of organisms for which clock genes are available, can be accessed by logged users from any page by clicking the **Clock Genes** sidebar link. Access to this functionality and all succeeding functionalities requires that a user is at least a **registered user**.

Viewing Genes

Genes associated with an organism can be accessed by logged users through the **Clock Genes** page, where a list of organisms with records in the database is displayed. To view an organism's genes, click on the organism name. This redirects you to a page showing either the current known gene regulatory network for that organism, or a table of clock genes. Each gene in the network can be used to view **Gene Details**.

Viewing Gene Details

Information such as the chromosomal location, transcript structure, exons, protein structure, and single nucleotide polymorphisms (SNPs) are available in EUCLIS for each clock gene. To view these details for a specific gene, click on its name in the gene map or on the gene table (to access these, see **Viewing Genes**). Different information on genes may be displayed separately (see **Gene Views**)

GeneViews

Relevant gene information can be viewed at different levels of detail with GeneViews, a simple toolbar-based selector. The default view contains the following information:

1. Gene abbreviation
2. Full name(s)
3. Synonyms
4. Cross-references to external databases
5. Exons
6. Transcript length
7. Protein length
8. Annotations

You may shift from one view to another by toggling the GeneViews toolbar, which appears on top of every page showing gene Details.

Contents per view are summarized on the next page.

Gene Views Summary

The following table summarizes the content of each view:

**Not available for all entries*

Feature	Summary (Default)	Details	FASTA	Images	SNPs*	XML*
Abbreviation	✓	✓	✓	✓	✓	✓
Full name(s)	✓	✓	✓	✓	✓	✓
Synonyms	✓	✓	×	×	×	×
Chromosomal Location	×	✓	×	×	×	×
Transcript structure	×	✓	×	✓	×	×
Transcript length	✓	✓	×	×	×	×
Links to external sites	✓	✓	×	×	×	×
Exons	✓	✓	×	×	×	×
Protein Structure	×	✓	×	✓	×	×
Protein Length	✓	✓	×	×	×	×
Annotation	✓	✓	×	×	×	×
SNPs	×	✓	×	×	✓	×
FASTA-formatted sequence	×	×	✓	×	×	×
XML	×	×	×	×	×	✓

Viewing SNPs

SNPs for every gene may be accessed through either the **SNPs view** or **Details view**. With the exception of the flanks, all information on SNPs can be viewed on the page. To view the flanks, click on the **View Flanks** link for a particular SNP. Flanking sequences are displayed in a popup window.

Downloading SNPs

Worksheets containing all information on the SNP tables may be downloaded for each gene from the **SNPs view** or **Details view**. To start an automatic file download, click on the **Dowload SNPs** link above the SNPs table. SNPs may be downloaded by **registered users** and other users with higher access privileges.

Restricted functions
User level requirement: **lead annotator** or **annotator**

Adding Annotations

Annotations can be added from the **summary** or **default view** (see **viewing gene details** and **gene views**). To add an annotation, click on the **add annotation** button, which appears immediately below the table containing the gene descriptions. This redirects you to a page where you can enter your new annotation and add links to it. Enter the necessary information and click on **submit**.

Editing Annotations

Existing annotations may be modified using the **edit** link (under options) that appears beside each entry. Click on the link corresponding to the annotation you wish to change. You will be redirected to a page where you can edit your annotation text, change the annotation link, or add a link to reference. When you have made all the necessary changes, click on **save details**.

Deleting Annotations

To delete a specific annotation, click on the **delete** link (under options) that appears beside it. You will be prompted to confirm deletion. Click OK to proceed or cancel to abort the operation.

Restricted functions
User level requirement: **lead annotator**

Changing the default view

An annotator may change the default view of the clock genes page for their organism by clicking on the **Change Default View** button that appears below the gene network or the gene table. The default view is currently set to the network view.

The gene table view is currently available for Homo sapiens only.

Managing Annotation Staff

Adding an annotator

From the page displaying the gene network map of an organism, click on the **Manage annotation staff** button, then select **assign a new annotator**. You will be redirected to a page that lists all registered EUCLIS users. Select the **add as annotator** link that appears beside the name of the user you wish to add to the annotation staff. To view changes made to the annotator list, click on the **return to annotators page for your organism** button.

Removing an annotator

From the **manage annotation staff page**, click on the **remove** button that appears beside the name of an annotator.

Clock Images

The Clock Images module serves as a repository for images with their associated metadata for and from the users of EUCLIS. In this module , users may upload/download/search images that may be closely coupled with other modules in EUCLIS such as Clock Experiments. It also serves as the image source for Clock Family Trees and Clock Museum.

Restricted functions
User level requirement: **registered or restricted users**

Viewing/Searching Clock Images

Images in the repository may be viewed by a logged user from any page by clicking on the **Clock Images** sidebar link. All images hosted in the module will be displayed as thumbnails. Clock Images makes use of the concept of image sets, where the creator may allow each image in the set to be generally accessible (or public), or may choose to restrict access to other images to members of the set. If the image is set as open to public or if the user is a member of an image set to which an image belongs, it will have a link to the image itself and to the image set details. *If an image is designated as private, only its thumbnail can be viewed.*

The user may search the clock images module by specifying the image path name, the image set title, or the creator, or by specifying a keyword in the module search field. Results are grouped in two sets; these are comprised all the hits within image sets and all the hits within images.

Viewing Image Details

Image details contain information on the image set membership, creator, date of upload and miscellaneous comments. To view details pertaining to an image, click on its caption (or its filename, in the absence of a caption) from the Clock Images home page, from search results, or from the **image set details** page.

Viewing Image Set Details

From the Clock Images home page, click the **View Image Sets** link. A list of

available image sets will be displayed, from which a user may select a particular set. Alternately, image set details may be accessed through **Image details** (see **Viewing Image Details**), where the image set links of an image are displayed. Information on image sets include its title, creator, date of creation and the members who may access it.

Downloading Images and Image Sets

Images may be downloaded individually, or may be downloaded as a set, provided that a user has the appropriate privileges for these. If an image is publicly visible, it may be downloaded by registered users.

Individual image file downloads

To download a single image file, click on the **Download** button that appears on the same page as the image.

Batch download

A user may download multiple images to a single zipped file through an image set (see **Viewing Image Set Details**). From an image set, select the check boxes corresponding to the images that will be downloaded. Click on the **Download** button to save these images. By default, these will be saved in a file called outfile.zip. You can rename this when your browser prompts you for the local directory to which you want to save a file, or after you have downloaded the file.

Using View Manager

The View Manager feature allows a user to view multiple high-resolution images in a single page, and is accessible from the Clock Images home page and on image set details pages.

Creating a view

From the Clock Images home page or from an image set details page, select checkboxes under images that you wish to view simultaneously, then click the **Include in View** button.

Saving a view

To save a view, indicate the view name and click the **Save View As** button on top of the page.

Retrieving a saved view

Previously saved views may be accessed by clicking on the **My Saved Views** link on the Clock Images home page.

Deleting a view

To delete a view, go to **My Saved Views**, select the views that you want to remove, then click **Delete.**

Restricted functions
User level requirement: **contributor**

Adding Images to Image Sets

Images may be added upon the creation of an image set (see **Creating Image Sets**) or to existing image sets. Select the image set which you wish to add images to, then click the **edit** button, then select **add more images**. You will be redirected to a page where you can indicate the file paths of the images you wish to upload. To select these files from a local folder, click on the **Browse** button to specify its location in your hard drive. For each image, a user may set the visibility to public or private by using the dropdown menu that appears below each image file path. Alternately, users may add images to an existing image set. Select the **edit** button on the image set details page (see **Viewing Image Set Details**), then select **Add More Images**. *Each image file uploaded to EUCLIS must not be larger than 20 MB.*

Editing Images

Select the **edit** button from the **image set details** page. This redirects the user to a page where comments may be entered, and where image accessibility may be changed. To save changes, click the **Submit** button. **Users are only allowed to edit images that they have uploaded.**

Deleting Images

To delete images from an image set, view the image set to which it belongs (see **View Image Set Details**), select the checkbox that appears under the

thumbnail(s) of the image(s) that you want to delete, then click the **Delete** button. A user may also select an image (see **View Image Details**), then click on the **Delete** button. **Users are only allowed to delete images that they have uploaded.**

Editing Image Sets

From the image set details page, select the **edit** button. This redirects the user to a page where image set attributes (title and description) may be altered. The same page also allows the coordinator to add and remove images and/or members to or from an image set. Click the **Update** button to save changes.

Restricted functions
User level requirement: **image set coordinator**

Creating Image Sets

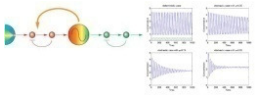
From the main page, select the **Create Image Link** that appears on top of the page. Enter the image set title and description on the page that appears and click the **Create Image Set** button.

Adding Members to Image Sets

To add members to an image set, view its details (see **Viewing Image Set Details**) then select **Edit**, then select **Add Member**. This redirects you to a page displaying the list of all EUCLIS members. Indicate the membership type for all members that you wish to include in the image set using the dropdown menu that is available for each name. A member may be designate as an image contributor or an image contributor, or as a regular image set member.

Deleting Image Sets

To delete an image, view its details (see **View Image Set Details**), then select the **edit** button. This redirects you to a page where you can select the **Delete Image Set** to delete the whole set.

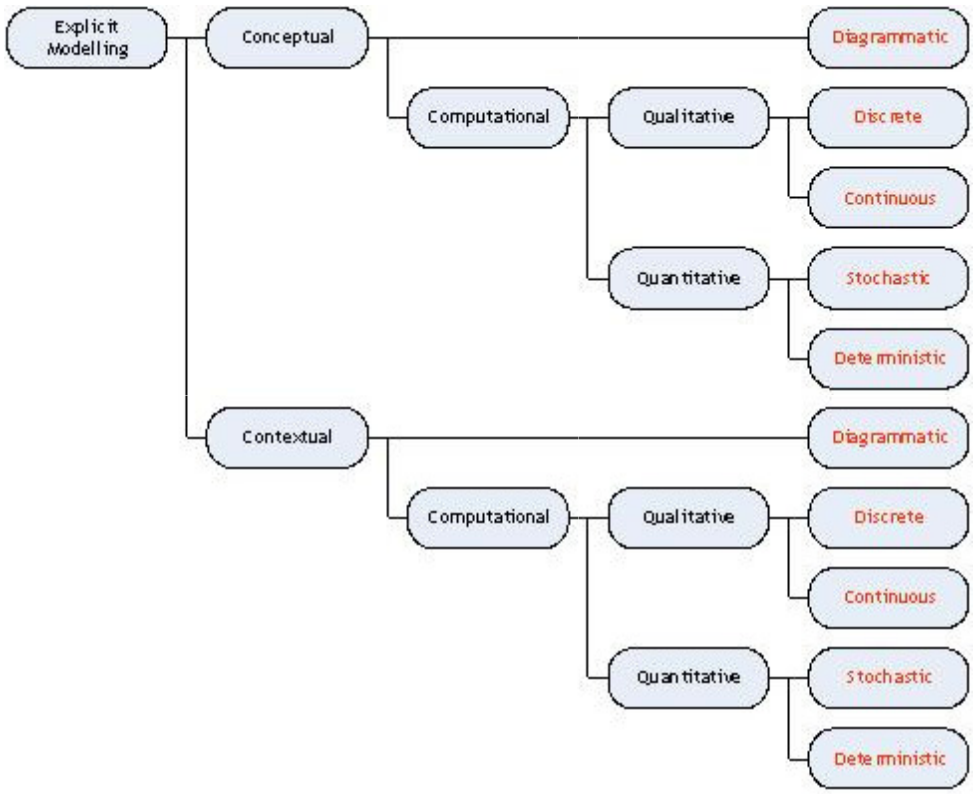


Clock Models

Clock Models features a collection of circadian models from several published papers in chronobiology. Theses are classified according to a taxonomy presented in a study by Roenneberg and co-authors. To allow a more efficient present ation of the models to users, each entry in the collection is provided with attributes (scale, scope, size, type, biological aspects, tools, computational properties, experimental evidences) and an accompanying portable document format (pdf) file which contains a summary of the reference from which the model was taken.

Viewing/Searching Models

A logged user may view the taxonomy diagram by clicking on the **Clock Models** sidebar link. This module displays biological models categorized according to the following taxonomy:



In the preceding diagram, the leaves (in red) serve as the classification of the models and the user can click on any of these to view all the models belonging to these categories. Alternately, the user may search the database using keywords for the name, scale, scope, size, type, biological aspects, tools, experimental evidence or computational properties of a model. Models are subsequently based listed using names, which are based on the name of the first author of the source paper.

Viewing Model Details

To view the details pertaining to a model, click on its name from the **list of models** page (see **Viewing/Searching Models**). This redirects you to a page containing the following information on the model:

Description
A brief description of the model with accompanying diagrams in PDF format.

Scale
•Possible Values: Single or Multiscale
•Cites the organism level or detail the model is describing. Is it in the cellular/molecular level? Or is it dealing with (whole) organ, such as the SCN?

Scope
Answers the following questions:
Is the paper presenting models for specific organism or does it talk about the model in a general sense?
If modeling specific organism, which organism?

Size
Shows the number of nodes or reactions, the number of pathways, and the number of biological components, such as proteins.

Type
•Determines whether the model is ultradian/circadian or evolutionary.
•Indicates the structure, in terms of the number of loops or feedbacks.

Biological Aspects
Indicates the biological aspects present in the model. Examples are phosphorylation, transcription-translation

Method
•Quantitative or Qualitative
•Discrete or Continuous
•Stochastic or Deterministic
•Also includes the actual method used such as Michalis-Menten, BST, Mass Action, etc.

Tools
Names the tools used for simulating the model

Computational Properties
States the standards used such as SBML and MIRIAM

Experimental Evidence
Includes experimental evidences for the model.

Downloading Model Description

Click on the hyperlink for the **description** from the model details page to open a new browser window where the document contents will be loaded. To save the data to your local drive, use the save function of your browser (File -> Save As/ File -> Save Page As).

Restricted functions
User level requirement: **model coordinators**

Editing Model Entries

From the **model details** page, click on the **edit** button. Enter the changes in the details form and then click **Update**.

Deleting Model Entries

From the **model details** page, click on the **Delete** button to delete the model entry from the list. A delete confirmation dialog will be shown; to confirm delete, click **OK**.

Adding Model Entries

To add a model entry, go to the main page of **Clock Models** where the taxonomy diagram is displayed and scroll down to the end of the page. Click on the hyperlink "**Add New Model**". Enter the information in the details form and then click **Add Model**.

Clock Museum

Clock Museum provides users with a way to create collections for restricted or general viewing by other users in EUCLIS. Collections are groups of slideshows comprised of photos, linked images and linked references from the Clock Images and Clock References modules of EUCLIS. A collection may also contain relevant notes contributed by other users. There will be standard, public and private collections, individually described as follows:

Standard collection

The standard collection will contain curated and annotated slideshows, images and links. This may only be created by a curator, but may be accessed by registered users.

Public collection

A public collection contains slideshows, images and links that may be created by and accessed by any registered user.

Private collection

A private collection contains images from a single image set in clock images; this collection may be created and viewed by members of the particular image set where the material was obtained.

Viewing List of Collections

The list of collections in Clock Museum may be accessed by clicking on the Clock Museum sidebar link. A table of collections categorized as Standard, Private or Public will be displayed, from which a user may select the specific collection that s/he wants to view.

Viewing a Collection

To view the details of a collection, click on the title of the collection from the collection list page (see **Viewing List of Collections**). Collection details include its description, creation and update information, the list of images and references linked to it, and a table of notes contributed by EUCLIS users on the collection. A list of associated slideshows, and a preview of one of these

slideshows, are also shown.

Preview a Collection Slideshow

To preview the images making up a slideshow in a collection, click on any of the slideshow titles listed in the collection details page (see **Viewing a Collection**). This displays the preview of the slideshow selected by the user .

Viewing a Linked Image

To preview an image linked to the collection, one may click on any of the image name or description under the Images list of the Related Links table in the collection details page. This displays the actual image and information related to it.

Viewing a Linked Reference

To preview a reference linked to the collection, one may click on any of the reference titles under the References list of the Related Links table in the collection details page. This displays the information about the literature linked to the collection.

Creating a new Collection

A user may create a new collection by clicking on the **Create New** link beside the header of the type of collection (standard, public or private) one wishes to create. The user needs to specify the title of the collection, a description for it, keywords related to the collection and the category to which it belongs. Clicking on the **Create Collection** button will add the new collection to the system.

Adding a Collection Slideshow

A user may add new slideshow for a collection by clicking on the **Add** link beside the slideshows header in the collection details page. This directs the user to a page prompting for the title and description of the slideshow that s/he wishes to add. Clicking on the **Add Slideshow** button redirects the user to the page for adding images, which displays the image sets and the corresponding list of images per set that can be used for the slideshow. To select an image to add to a slideshow, the user should click on the checkbox below the image/s. Click on the **Include Selected Images** button to create the show.

Adding a Collection Image

A user may link a new image to the collection by clicking on the **Add** link beside the images header in the collection details page. This redirects the user to the add image page, where the image sets available to the user and the list of images under it are displayed. To link the image, click on the checkbox below it, then click on the **Include Selected Images** button. To link multiple images at the same time, click on the checkboxes below the images to be included and click on the **Include Selected Images** button.

In the event that a user is adding a collection slideshow or adding a collection image, and is unable to find the image that s/he wants to include, s/he may click on the link provided in the instructions text below the list of images shown in the page. This option will only be available to Image Set Coordinators and Image Set Contributors of the image set s/he is currently viewing. For other users, instructions on how to contact ClockHelp will be provided in the page.

Adding a Collection Reference

A user may link a new reference to the collection by clicking on the **Add** link beside the References header under the collection details page. This redirects the user to a page containing the list of reference collections. Click on the reference collection title to view the references under that collection, then click on the reference titles to view details about a reference. Click on the **Link this reference** button to link a reference to the collection.

Adding a Collection Note

A user may link a new reference to a collection by clicking on the **Add** link beside the Notes header under the collection details page. This redirects the user to a page where s/he can input the text of the note, and where s/he can specify if the note will be publically available or not. Click the **Add Annotation** button to associate the note with the collection.

Restricted functions
User level requirement: **Registered user; Curator/Lead Curator**

Editing a Collection

A curator or a lead curator may edit a collection by clicking on the **Edit** button beside a specific collection in the collection list page or by clicking the **Edit Collection** button that appears at the bottom of the collection details page.

For registered users, collection editing is restricted to the collections which s/he created; consequently, the Edit or the Edit collection button may not be available at all times in all collections.

Once a user is in edit mode, information about the collection, (i.e. title, description, keywords and category) may be updated. Click on the **Save Changes** button to save modifications. Under this mode, a user may also delete slideshows created for the collection, as well as images, references and notes associated with it. A user may likewise edit slideshows and notes created for the collection in this mode. Click on the **Done** button at the bottom of the page to save changes.

Editing a Collection Slideshow

A lead curator, a curator or the creator of a collection may edit a slideshow by clicking the **Edit** button that appears beside each slideshow title in the **collection details** page.

In Edit Mode, a user may modify information about the slideshow, remove an image or images from it, add images to the slideshow, or change the sequence of the images in the slideshow. Detailed instructions for performing these tasks are provided within this section. Click on the **Save Changes** button to finish editing the slideshow.

Removing Image/s from the Slideshow

To remove image/s from the slideshow, clicking on the checkbox/es below the image/s to be removed, then click on the **Remove Image** button.

Adding an image or images to a slideshow

A user may add image/s to an existing slideshow by clicking on the **Add** link in the **edit slideshow** page. This redirects the user to a page that displays the image sets and the list of images under it from which the user can choose. Select an image set, then click on the checkbox/es below the image/s to be added to the slideshow. Cicking the I**nclude Selected Images** button to save changes.*

*See information box on page 34.

Changing the image sequence in a slideshow

A user may change the sequence of images in a slideshow by clicking on the **Edit Image Sequence** link in the **edit slideshow** page. The user is redirected to a page where it is possible to specify the position that an image will take in the slideshow; the text box appears beside each of the images listed in the page. Click on the **Save Changes** button to apply changes.

Editing a Collection Note

A user may edit a note within a collection that s/he create by clicking the **Edit Button** associated with it under the list of notes in the **collection details** page. *This function can be accessed by Lead Curators and Curators by clicking on the Edit button or the Edit Collection buttons.* In edit mode, a user may modify the contents and the visibility of a note. Click on the **Save Changes** button to apply the modifications.

Deleting a Collection

A user may delete a collection by clicking on the **Delete** button on the rightmost part of the collection entry (see **Viewing List of Collections**). *This option is generally available for Lead Curators and Curators; other users may only delete collections s/he created.*

Deleting a Collection Slideshow

A user may delete a collection slideshow by clicking on the **Delete** button beside the slideshow title that appears in the slideshow list on the **collection details** page.

Deleting a Collection Image

A user may delete a collection image by clicking on the **Delete** button beside the image name or description in the image list that appears in the **Related**

Links table in the **collection details** page.

Deleting a Collection Reference

A user may delete a collection reference by clicking on the **Delete** button beside the reference title listed in the reference list within the **Related Links** table in the **collection details** page.

Deleting a Collection Note

A user may delete a collection note by clicking on the **Delete** button beside the note that appears in the table of notes within the **collection details** page.

Clock References

Clock References is a repository of bibliographic entries of journal articles, old manuscripts, books and PhD Theses in EUCLIS. Efficient file sharing is facilitated through the availability of functions for file and link uploading, as well as for link viewing. The default accessibility requirement for use of the library is for a **registered user**.

Viewing/Searching Bibliographic Entries

Bibliographic Entries may be viewed by a logged user from any page by clicking on the **Clock References** sidebar link. Alternately, the user may search the database using keywords or the author's name, title or the year a reference was released.

Viewing Bibliographic Details

To view bibliographic details, click on the title of the reference entry from the **table of references** page (see **Viewing Bibliographic Entries**). This redirects you to a page containing information on the publication.

Restricted functions
User level requirement: **restricted user**

Exporting Entries to EndNoteXML Files

Use the checkboxes in the rightmost column of the **table of references** to select entries to be exported; to select all entries, click on the topmost checkbox, then click **export** to generate the EndNoteXML file. Download the generated file by clicking on the link provided. The user can then have a local copy of the entries by importing from the downloaded file using his/her EndNote application.

When using the Import functionality of EndNote, specify "EndNote generated XML" as the Import Option and "Unicode (UTF-8)" as the Text Translation.

Downloading Documents

Click on the **download document** button from the bibliographic details page to open a new browser window where the document contents will be loaded. To save the data to your local drive, use the save function of your browser (File -> Save As/ File -> Save Page As).

Restricted functions
User level requirement: **library contributor**

Uploading Documents

Click on the manage document button from the bibliographic details page to open a new browser window to upload document contents. Use browse button to find the document to be uploaded and then click upload button to complete the process.

Editing Bibliographic Entries

From the **bibliographic details** page, click on the **edit** button. Enter the changes in the details form and then click **submit**.

Deleting Bibliographic Entries

From the **bibliographic details** page, click on the **delete** button to delete the entry on the table. A delete confirmation dialog will be shown; to confirm delete, click OK.

Adding Bibliographic Entries

To add a bibliographic entry, go to the main page (**Clock References**) and scroll down to the end of the page. The options for adding entries are presented here: manual entry addition, Endnote/Reference Manager file import, or external database import. Each variant is discussed separately.

If it is possible, we are requesting contributors to follow this format for authors in bibliographic entries:

Smith, J.A., Doe, J.A., and Doe, J.B.

Manual entry addition

From the main page, select **add new reference**. You will be redirected to a page containing a form where you can enter the details for a publication. Fill up the form and click **submit**.

Importing an Endnote/Reference Manager file

To upload an Endnote or Reference Manager file, select **import references from file**. Select the file type that you wish to import, specify the file location in your local drive, then click **import**.

Importing from an external database

To upload a bibliographic entry from an external database, select **import references from external database**. Choose the database from which you want to obtain information, type the keywords, and click **go**. Retrieved document titles will be displayed. Select all checkboxes of documents which you want to save in EUCLIS, then click **submit**. Currently, only a link to PubMed is available.

For adding theses, a registered user should e-mail Clockhelp first about his/her intention to upload his/her thesis and wait for approval. If the request is approved a new bibliographic entry must be created for the paper before it can be uploaded.* ***No paper can be uploaded without an existing bibliographic entry.*

Managing Clock References Collection Users

From the main page (Clock References), scroll to the bottom of the page and select the option for managing Clock References accounts (i.e. You can manage Clock References accounts by clicking **here**). You will be redirected to a page showing a table of users. Select the **login** name of the user whose account you wish to edit. From the user's details page, select **edit**. Select a new Clock References access level for the user and click **submit**.

Euclis PhD Thesis Collection

EUCLIS currently has a facility for uploading dissertations on chronobiology research, the PhD thesis collection. Theses may only be uploaded by users with **library contributor** privileges. **Registered users** may view and download theses in the collection.

Accessing the collection

You must be logged into EUCLIS to access the collection. From the main page, click on **Clock References**, then click the **PhD thesis collection** link.

Adding a thesis

Creating a bibliographic entry

It is necessary to create a reference to a PhD thesis before it can be uploaded. On the PhD thesis collection page, select **Add New Reference**. You will be redirected to a form for where you can enter the details for a publication. Fill up the form and click **submit**. The PhD collection will be updated, and will show the newly created entry in the list of available theses.

Uploading a PhD thesis

Once a bibliographic entry for a dissertation has been created (see previous item), one may now upload the PhD thesis. Click on the thesis title from the list of theses, then click on the **Manage Document** button. You will be redirected to a page from which one can upload the document. Specify the path of the document that you wish to upload, then click the **Upload** button.

Downloading a Thesis

To download a thesis, click its title from the list of theses, then select **Download Document**.

Modifying files associate with a Thesis

To change the file associated with a bibliographic entry, select the title of the thesis from the theses list, then click the **Manage Document** button. Click on the **Browse** button to specify the file path of the replacement file, then select **Upload**. To delete the file currently associated with the thesis, select the title of the thesis from the theses list, click **Manage Document**, then select **Delete Associated Document**.

Removing a Thesis

To remove a thesis, click on the thesis title and select **Manage Document**. The details of the document will be displayed. Click the **delete** button and confirm the delete action.

Clock Tools

Clock Tools provides information on and links to applications used by chronobiologists for processing and analysing data. Currently available tools include applications for analysis, visualization, imaging and modelling.

Viewing Tool Sets

Groups of chronobiology tools may by a logged user from any page by clicking on the **Clock Tools** sidebar link.

Viewing Tool Details

Information on specific tools may be accessed by selecting a particular tool set (e.g. analysis-geared tools) from the main page of Clock Tools, then select the name of the tool to view information on it. Currently, the tool details page lists information on operating system compatibility, licensing, and contact information of the individual(s) who developed the tool.